$$\int_0^{\pi} 1-\cos^2 x$$

$$\frac{1}{2}\int\left[(2\cos^2 x - 1) + 1\right] dx$$

$$\frac{1}{2}\cdot\frac{1}{2}\int(\cos 2x + 1)\,dx \quad , \qquad u = 2x$$

$$\frac{1}{4}\int(\cos u + 1)\,du \qquad du = 2\,dx$$

$$\frac{1}{4}(\sin u + u)$$

$$\frac{1}{4}(\sin 2x + 2x) = \boxed{\frac{x}{2} + \frac{\sin 2x}{4}}$$

$\pi/2 + (0 - 0)$

$\boxed{\pi/2}$

2. $\int_{-\pi/3}^{\pi/3} \frac{1}{2}\sec^2 t \;-\; \int_{-\pi/3}^{\pi/3} -4\sin^2 t$

$F(t)$

$\cos 2A = 1 - 2\sin^2 A$

$-2(\cos 2A - 1) = (-2\sin^2 A)\cdot 2$

$-2\cos 2A + 2 = 4\sin^2 A$

$\frac{1}{2}\tan \pi/3 - \frac{1}{2}\tan -\pi/3$

$\int_{-\pi/3}^{\pi/3} -2\cos 2x + 2$

$\to -\sin 2x + 2x$

$\left(\frac{2\pi}{3} - \sin\left(\frac{2\pi}{3}\right)\right) - \left(-\frac{2\pi}{3} - \sin\left(-\frac{2\pi}{3}\right)\right)$

$\sqrt{3} \quad + \quad \left(\frac{2\pi}{3} - \frac{\sqrt{3}}{2}\right) - \left(-\frac{2\pi}{3} - -\frac{\sqrt{3}}{2}\right)$

$\sqrt{3} + \frac{2\pi}{3} - \frac{\sqrt{3}}{2} + \frac{2\pi}{3} - \frac{\sqrt{3}}{2}$

$\sqrt{3} + \frac{4\pi}{3} - \cancel{\frac{2\sqrt{3}}{2}}$

$\cancel{\sqrt{3} - \sqrt{3}} + \frac{4\pi}{3}$

$\boxed{\frac{4\pi}{3}}$

2/p 395 $A = \int_{-\pi/3}^{\pi/3} \left(\frac{1}{2}\sec^2 t + 4\sin^2 t\right) dt$

• $\int \sin^2 ax \, dx = \frac{x}{2} - \frac{\sin 2ax}{4a} + c$

$\Rightarrow \int \sin^2 x \, dx = \frac{x}{2} - \frac{\sin 2x}{4} + c$

• $\int \cos^2 ax \, dx = \frac{x}{2} + \frac{\sin 2ax}{4a} + c$

$\Rightarrow \int \cos^2 x \, dx = \frac{x}{2} + \frac{\sin 2x}{4} + c$

$= \left[\frac{1}{2}\tan t + 4\left(\frac{t}{2} + \frac{\sin 2t}{4}\right)\right]_{-\pi/3}^{\pi/3}$

$= 0.5\tan(\pi/3) + \frac{4}{2}\cdot\frac{\pi}{3} + \sin\left(2\cdot\frac{\pi}{3}\right) - \left[\frac{\tan(-\pi/3)}{2} - 2\cdot\frac{\pi}{3} + \sin\left(\frac{2\pi}{3}\right)\right.$

$= \frac{\sqrt{3}}{2} + \frac{2\pi}{3} + \frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} + \frac{2\pi}{3} + \frac{\sqrt{3}}{2} = 2\sqrt{3} + 4\pi/3$

$= 7.65$

5/p 395 $A = \int_{-2}^{2} \left(2x^2 - x^4 + 2x^2\right) dx$

2/p 395 $A = \int_{-\pi/3}^{\pi/3} \left(\frac{1}{2} \sec^2 t + 4 \sin^2 t \right) dt$

- $\int \sin^2 ax \, dx = \frac{x}{2} - \frac{\sin 2ax}{4a} + c$

$\Rightarrow \int \sin^2 x \, dx = \frac{x}{2} - \frac{\sin 2x}{4} + c$

- $\int \cos^2 ax \, dx = \frac{x}{2} + \frac{\sin 2ax}{4a} + c$

$\Rightarrow \int \cos^2 x \, dx = \frac{x}{2} + \frac{\sin 2x}{4} + c$

$= \left[\frac{1}{2} \tan t + 4 \left(\frac{t}{2} + \frac{\sin 2t}{4} \right) \right]_{-\pi/3}^{\pi/3}$

$= 0.5 \tan(\pi/3) + \frac{4}{2} \cdot \frac{\pi}{3} + \sin\left(2 \cdot \frac{\pi}{3}\right) - \left[\frac{\tan(-\pi/3)}{2} - 2 \cdot \frac{\pi}{3} + \sin\left(\frac{2\pi}{3}\right) \right.$

$= \frac{\sqrt{3}}{2} + \frac{2\pi}{3} + \frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} + \frac{2\pi}{3} + \frac{\sqrt{3}}{2} = 2\sqrt{3} + 4\pi/3$

$= 7.65$

5/p 395 $A = \int^{2} \left(2x^2 - x^4 + 2x^2 \right) dx$

8:06 AM

7.2 #3, 4, 8-10, 15-31 (5), 43, 44